



Wellington Astronomical Society April 2016 Volume 46 Issue 3

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The next WAS meeting will be held at 7:30 pm, Wednesday 6th of April at Carter Observatory, Upland Rd, Kelburn, Wellington

"Where are all the Aliens?" An Introduction to the Fermi Paradox – Josh Gross



The guest speaker at this month's meeting will be Josh Gross.

It's highly unlikely that we're the only intelligent civilisation in the universe, and yet we've never seen any evidence of other life. If other civilisations are out there, why haven't we heard from them? This conundrum is known as the "Fermi Paradox", or the "Great Silence". In this presentation, we explore some of the theories surrounding this paradox.

Josh works as a web developer and has no formal background or qualifications in astronomy but he has a strong interest in space, science fiction, and futurology. This presentation is based on articles and blog posts he researched online.

Inside this issue:

Cretney Bequest - current status	3
Comet 252P/Linear	3
List of events for April 2016 – Global Astronomy Month	5
2016 RASNZ Conference	7
2016 RASNZ Conference Astrophotography Symposium	7
April Night Sky Chart	8
The Night Sky in April	9

2015 — 2016 SUBSCRIPTIONS DUE

The new subscription year began in September, so WAS looks forward to receiving your subscription renewal.

Renewal forms can be found on the website, but a summary follows:

Subscription for Newsletter by Email 2015-2016

Adult/Waged: \$ 50.00

Student/Unwaged: \$ 30.00

Family: \$ 70.00

Payment methods:

Cheque - make out to Wellington Astronomical Society Inc, and mail to PO

Box 3181, Wellington 6140

Direct Deposit or Internet Banking - use Acc No: 03-0502-0508656-00, please include reference so WAS knows who is making the payment

Cash - please bring exact amount to meeting

WAS COUNCIL MEMBERS AND CONTACTS

Council Members

The following members were elected to Council at the Nov 2015 AGM

President: Antony Gomez

Vice President: Duncan Hall

Secretary/Telescope custodian: Chris Monigatti

Treasurer: John Homes

Website (joint): John Homes & John Talbot

Councilors

Frank Andrews

Janine Bidmead

Peter Graham

Aline Homes

Murray Forbes

James Smith

Peter Woods

Newsletter Editor: editor@was.org.nz

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Cretney Bequest - current status

Duncan Hall circulated the draft Joint Venture Agreement between WAS and GOT by email on December 3 2015 to WAS Council members

Duncan and Peter Graham have addressed all the feedback they received about that draft, plus some of their own.

They produced a revised draft, which Duncan emailed on March 19 to WCM Legal for their review.

WCM Legal will check that the revised wording is reasonable from a legal point of view.

Once that review is complete, the newly revised agreement will be circulated to WAS Council members.

Currently there may still be some more work required on an annex to the agreement.

This will be to establish the relative values of contributions by the two organisations to the initial observatory/telescope combination.

The initial combination is planned to be established at the Gifford Observatory.

A draft name for it is the "Phase I Remote Observatory" (PIRO)

Other next steps will be:

- Formation of a Cretney Bequest Committee (CBC) – a WAS-GOT committee to progress the project

- Development of a budget to implement the PIRO

- Development of a project plan to implement PIRO

- Assignment of tasks among the members of the CBC

- Development of a budget to operate the PIRO once it is established

Comet 252P/Linear

The following page shows an image of Comet 252P/Linear taken by WAS member Edward Wilcock on the 20th April at 5:30am near Featherson. Five horizontal images merged in Photoshop to create the final image. Taken with a Canon 7D Mk II with a Samyang 24mm f/1.4 - 13s exposure at f/2.8 ISO 6400. Edward took up astrophotography just a few years ago as a year 11 student.

Photographs show that Comet LINEAR has a greenish color, caused by molecules of diatomic carbon (C₂) that are fluorescing in sunlight. However, the green tint likely won't be evident unless you view the comet through a telescope.

Given the comet's unexpected surge, astronomers aren't sure how long it will remain even binocular-bright. It passed closest to Earth, just 3.3 million

miles away, on March 21st. Now it's moving away from both Earth and the Sun.

Another small visitor, called Comet PanSTARRS (designated P/2016 BA14), passed even closer to Earth—about 2.2 million miles away—on March 22nd. It is also crossing our skies now but is too faint to be seen except with a large backyard telescope. The timing of these paired visits is probably no coincidence. The "P" in both comets' designations means they are in periodic (elliptical) orbits that bring them near the Sun repeatedly, in this case about every 5 years. Their orbits are so similar that comet specialists suspect these two bodies are fragments of a single object.

LINEAR is an acronym for Lincoln Near Earth Asteroid Research, an MIT Lincoln Laboratory program funded by

the U.S. Air Force and NASA. Its team discovered Comet 252P on April 7, 2000. PanSTARRS stands for Panoramic Survey Telescope & Rapid Response System, a wide-field imaging telescope developed by the University of Hawaii's Institute for Astronomy. Its team discovered Comet P/2016 BA14 on January 22, 2016, and the alphanumeric designation indicates that astronomers initially believed this object to be an asteroid. The ice-rich cores, or nuclei, of these two bodies are very roughly 750 feet (230 meters) and 350 feet (100 meters) across, respectively.

Read more at: <http://phys.org/news/2016-03-comet-252plinear-soars-predawn-view.html#jCp>



Photograph of Comet 252P/Linear

List of events for April 2016 – Global Astronomy Month



Global Astronomy Month (GAM) each April is the world's largest global celebration of astronomy since the unprece-

dent International Year of Astronomy 2009.

<http://astronomerswithoutborders.org/global-astronomy-month-2016.html>
<https://www.facebook.com/gam.awb/timeline>

Astronomy, detailed in the sub-sections following this one.. Please support these events by coming along and bringing friends and family to these events.

WAS has organised and are involved in a number of public events promoting

The Universe Next Door

The multiverse is a hypothetical theory for several universes existing, including the universe we live in. Together, these universes comprise everything that exists: space, time, matter, energy, and the physical laws and constants that describe them.

Multiple universes have been hypothesized in cosmology, physics, astronomy, religion, philosophy, transpersonal psy-

chology, and fiction. Commonly called parallel universes, the theory has many names, including parallel dimensions, alternate realities, and dimensional planes.

Antony Gomez presents a Tuesday Talk on the science of other universes, and how experimental science could lead us to detecting a neighbouring universe. Such science can also help us to unravel

some of the questions within our own universe, such as the mysteries of dark matter and dark energy.

Date: Tuesday, 5th April

Time: 7:00 pm

Venue: Space Place (formerly Carter Observatory)

Details: <http://www.eventfinda.co.nz/2016/>

"Where are all the Aliens?" An Introduction to the Fermi Paradox

It's highly unlikely that we're the only intelligent civilisation in the universe, and yet we've never seen any evidence of other life. If other civilisations are out there, why haven't we heard from them? This conundrum is known as the

"Fermi Paradox", or the "Great Silence". In this presentation, we explore some of the theories surrounding this paradox.

Date: Wednesday, 6th April

Time: 7:30 pm

Venue: Space Place (formerly Carter Observatory)

See front page for more details

WAS Observing Evening

Come along and see (weather permitting) the many wonderful objects, star clusters, galaxies, dying stars and nebulae around and near the Southern Cross, the Magellanic Clouds, Jupiter and its moons, and the Orion nebula.

Date: Saturday, 9th April

Time: 7:00 pm

Venue: Tawa College

Astronomy Club Night

A short presentation and observing the night sky. **Venue:** Hutt International Boys School

Date: Thursday, 14th April

Time: 7:00 pm

Stories Behind the Art of Night – Mark Gee

Celebrate Global Astronomy Month and join the 2013 Astronomy Photographer of the Year, Mark Gee, for a night of astrophotography!

Mark will talk about the stories behind his images and share insight into how he works including when things don't go to plan!

Bring your DSLR camera and tripod, if the sky is clear, we'll head outside after the talk for a bit of stargazing (telescopes provided) and Mark will answer technical questions about photographing the night sky.

Date: Friday, 15th April

Time: 6:30 pm

Venue: Lower Hutt War Memorial Library

Details: <http://www.eventfinda.co.nz/2016/mark-gee-stories-behind-the-art-of-night/lower-hutt>

Global Star Party

GAM's ultimate observing event is the Global Star Party. If you have a scope, it's B.Y.O.T. - Bring Your Own Telescope (or binoculars). Don't have a scope, don't worry, we have plenty available to look through. All are invited, all will be excited!

The Global Star Party is the time to come out under the stars, bridge gaps across the seas, and join your brother and sister skywatchers in proving that the world is "One People, One Sky." When we turn our gaze upward all religious, national, cultural and political barriers fade into the darkness.

Date: Saturday, 16th April

Time: 6:00 pm

Venue: Cricket Clubroom, Anderson Park

Wellington Engineering and Science Festival 2016 Lecture Series "Where to next? Human spaceflight at the crossroads" – David MacLennan

NASA's long-term vision is for a human mission to Mars, but its strategy for getting there is flawed, as it does not include the most logical intermediate step: a return to the Moon.

Instead, NASA's proposed intermediate step is to retrieve a large boulder from an asteroid and send an astronaut crew out to investigate it – a plan that is not getting much support from either Congress or the scientific community.

A return to the Moon would be a better way to prepare for a journey to Mars, as much of the technology needed for a Mars mission, such as habitats, life-support systems, rovers, tools and instruments, could be first proven under real off-world conditions on the Moon. In addition, recent robotic missions have shown the Moon to be a worthwhile scientific target in its own right.

Date: Saturday, 16th April

Time: 6:00 pm

Venue: Cricket Clubroom, Anderson Park

Details: <https://www.eventbrite.co.nz/e/wellington-engineering-and-science-festival-opening-lecture-tickets-23863754131>

Sun Day

Sun 24th – Sun Day: 11am – 4pm, Space Place.

Let's celebrate our star, the Sun!

Awareness and appreciation of the Sun. Telescopes will be available to look at our nearest star.

Date: Sunday, 24th April

Time: 11:00 am – 4:00 pm

Venue: Space Place (formerly Carter Observatory)

Details: <http://sdo.gsfc.nasa.gov/>

2016 RASNZ Conference

This year's RASNZ Conference will be hosted in Napier by the Hawke's Bay Astronomical Society.

You don't need to be a RASNZ member to attend, anyone is welcome. However, RASNZ members qualify for a discount, so joining up may be worthwhile.

Usually 80 – 100 participants attend these conferences, so it pays to book accommodation early.

The guest speaker this year is Dr Michelle Bannister. Dr Bannister works on the Outer Solar System Origins Survey, which tries to understand the formation and evolution of the Solar System. Her main talk will be "Pluto: Once a Point of Light, Now a World", and she will also be giving a public lecture on Sunday afternoon.

Dates: Friday, 20th May to Sunday 22nd May

Venue: Napier's Museum Theatre Gallery, 1 Tennyson Street (near Marine Parade)

Details: <http://rasnz.org.nz/Downloadable/Conference/2016%20RASNZConference%20Brochure.pdf>.

NOTE: WAS will be hosting the 2020 RASNZ conference in Wellington. If you would like to be involved in the local organizing committee, please contact Antony Gomez or Chris Monigatti.

2016 RASNZ Conference Astrophotography Symposium

The 2016 RASNZ Conference (see previous article) will be followed by an Astrophotography Workshop. This 1.5 day event will cover everything from getting the images at the telescope through to processing the images at the computer.

The symposium will have a range of top New Zealand astrophotographers presenting talks and speaking from personal

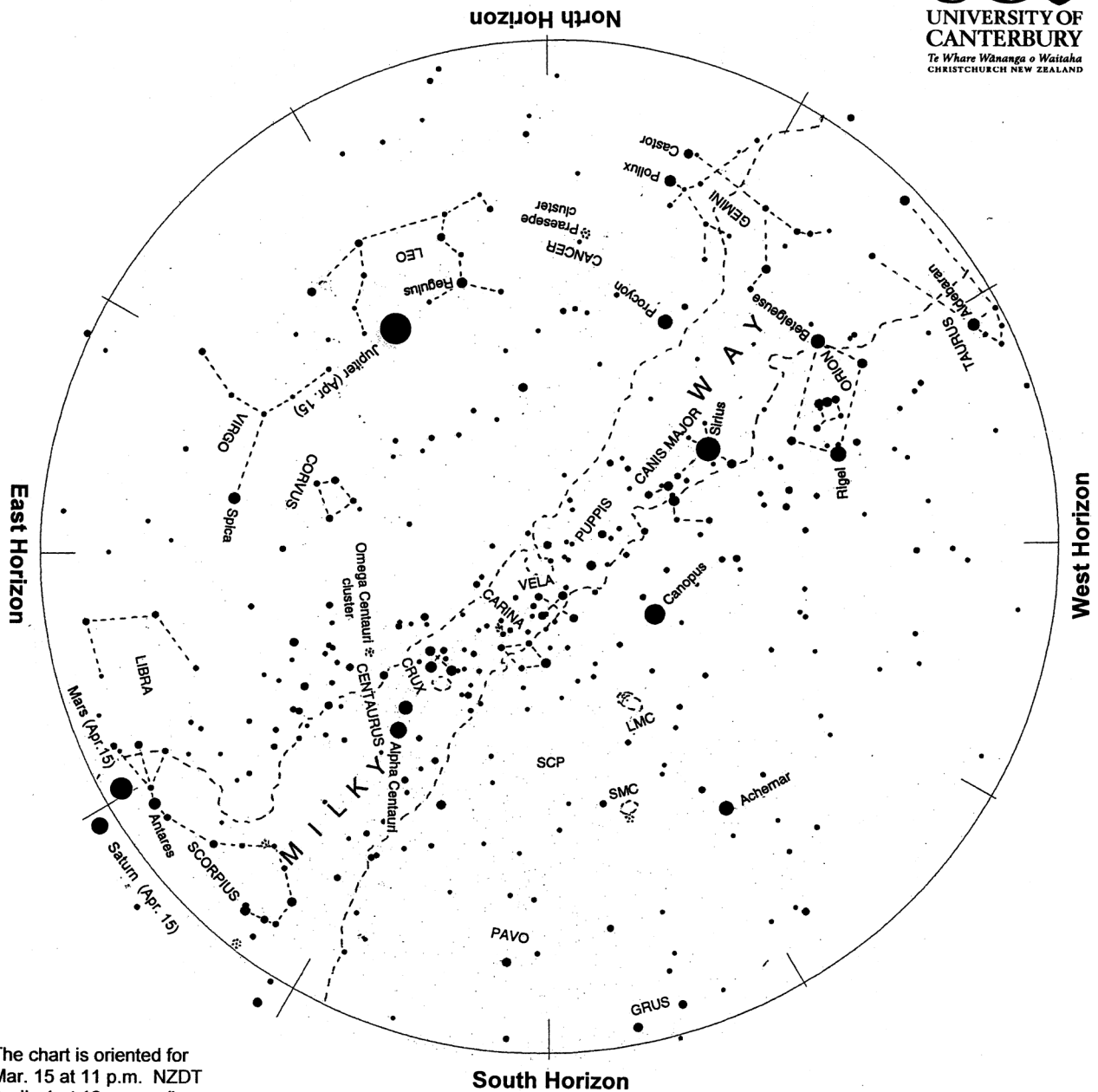
experience. In particular, Rolf Olson, arguably the best astrophotographer in New Zealand, will be sharing from his vast array of image processing skills.

Dates: Monday, 23rd May to lunchtime Tuesday 24th May 2016

Venue: Hawke's Bay Holts Planetarium (on the grounds of the Napier Boys' High School, Chambers Street, Napier)

Registration: <http://www.rasnz.org.nz/groups-news-events/conference-registration>

Queries or Offers to give talks: john_drummond@xtra.co.nz



The chart is oriented for
Mar. 15 at 11 p.m. NZDT
April 1 at 10 p.m. "
April 15 at 8 p.m. NZST
May 1 at 7 p.m. "

Evening sky in April 2016

To use the chart, hold it up to the sky. Turn the chart so the direction you are looking is at the bottom of the chart. If you are looking to the south then have 'South horizon' at the lower edge. As the earth turns the sky appears to rotate clockwise around the south celestial pole, SCP on the chart. Stars rise in the east and set in the west, just like the sun. The sky makes a small extra westward or clockwise shift each night as we orbit the sun.

Jupiter is the 'evening star', appearing in the northeast soon after sunset. It sets in the northwest in the morning hours. Mars is a bright orange-red 'star' rising in the southeast around 10 pm at the beginning of the month but four minutes earlier each night. To its right is Antares, also orange but fainter. Saturn is in the southeast straight below Antares. Sirius, the brightest true star, is midway down the western sky. Below it is Orion with bright stars Rigel, blue tinted, and orange Betelgeuse. Canopus, the second brightest star, is southwest of overhead. Crux, the Southern Cross, and The Pointers, Alpha and Beta Centauri, are high in the southeast sky.

The Night Sky in April

Jupiter is the 'evening star', appearing in the northeast soon after sunset. The bright real stars, **Sirius** and **Canopus**, appear soon after. Reddish **Mars** and off-white **Saturn** appear in the south-east. **Mercury** might be glimpsed low in the northwest twilight mid-month.

A small telescope will show the disk of Jupiter with its four bright 'Galilean' moons lined up on each side. Binoculars, held steadily, will sometimes show one or two moons looking like faint stars close to the planet. Jupiter is 700 million km away mid-month. The moon will be near Jupiter on the 18th.

Sirius is the first true star to appear at dusk, midway down the northwest sky. It is soon followed by Canopus, southwest of the zenith. Below Sirius are **Rigel** and **Betelgeuse**, the brightest stars in **Orion**. Between them is a line of three stars: Orion's belt. To southern hemisphere star watchers, the line of three makes the bottom of 'The Pot', now tipped on its side. Below and right of Sirius is **Procyon**.

Mars, looking like a bright reddish-orange star, appears in the southeast around 10 pm NZDT at the beginning of the month. To its right is **Antares**, similar in colour but fainter. Creamy Saturn follows Mars about 40 minutes later, rising directly below Antares. By the end of the month both planets are up around the end of twilight. The moon will appear near Mars and Saturn on the 25th.

Mars will brighten steadily through the month as we catch up on it. Its distance shrinks from 118 million km away at the beginning of April to 88 million km away at the end of the month. It remains a small object in a telescope. At mid-month a telescope needs to magnify 130 times to make Mars look as big as the Moon does to

the naked eye. We pass 75 million km from Mars at the end of May.

Saturn rises after 10:20 pm NZDT at the beginning of April; around 7:20 NZST by month's end. It is straight below Antares. A small telescope shows Saturn as an oval, the rings and planet blended. Larger telescopes separate the planet and rings and may show Saturn's moons looking like faint stars close to the planet. **Titan**, one of the biggest moons in the solar system, orbits about four ring diameters from the planet. Saturn is 1400 million km away mid-month.

Mercury (not shown) might be seen setting in the bright twilight mid-month. It looks like a lone bright star on the northwest skyline. It sinks back into the twilight in May as it passes between us and the sun.

Crux, the Southern Cross, is high in the southeast. Below it, and brighter, are **Beta** and **Alpha Centauri**, often called 'The Pointers'. Alpha Centauri is the closest naked-eye star, 4.3 light years (l.y.)* away. Beta Centauri, like most of the stars in Crux, is a blue-giant star hundreds of l.y. away. Canopus is also a very luminous distant star; 13 000 times brighter than the sun and 300 l.y. away.

The **Milky Way** is brightest in the southeast above Crux. The Milky Way can be traced to nearly overhead where it fades. It becomes very faint in the northwest, right of Orion. The Milky Way is our edgewise view of the galaxy, the pancake of billions of stars of which the sun is just one.

The Clouds of Magellan, **LMC** and **SMC** are midway down the southwest sky, easily seen by eye on a dark moonless night. They are two small

galaxies about 160 000 and 200 000 light years away.

Low in the north is the **Praesepe cluster**, marking the shell of **Cancer** the Crab. Praesepe is also called the Beehive cluster, the reason obvious when it is viewed in binoculars. Lower and further left are **Pollux** and **Castor**, the heads of **Gemini** the twins, making a vertical pair of stars. Though related in myth, the Twins are quite different from each other. Pollux is an orange star 31 times brighter than the sun and 34 l.y. from us. Castor is a hot white star about 47 times the sun's brightness and 51 l.y. away.

Venus is the brilliant 'morning star', rising due east about an hour before the sun.

*A light year (l.y.) is the distance that light travels in one year: nearly 10 million million km or 10¹³ km. Sunlight takes eight minutes to get here; moonlight about one second. Sunlight reaches **Neptune**, the outermost major planet, in four hours. It takes four years to reach the nearest star, Alpha Centauri.

Notes by Alan Gilmore, University of Canterbury's Mt John Observatory, P.O. Box 56, Lake Tekapo 7945, New Zealand.

www.canterbury.ac.nz